

## CLAIM OR CLAIMS

### WHAT IS CLAIMED IS:

1. A fiber pigtailed assembly for coupling light from an optical fiber to an  
5 optical detector comprising means for mounting the optical fiber adjacent to  
the optical detector, the optical fiber having a beveled end and having a  
diameter less than the area of a detector surface of the optical detector, so  
that the light from the beveled end impinges on the detector surface, the  
detector surface being tilted and rotated with respect to the beveled end to  
10 produce essentially zero polarization-dependent responsivity and low back  
reflection.
2. The fiber pigtailed assembly as recited in claim 1 further comprising  
means for adjusting a tilt angle of the detector surface with respect to the  
15 beveled end.
3. The fiber pigtailed assembly as recited in claim 1 wherein the mounting  
means comprises a housing having a fiber holding portion and a detector  
holding portion coupled together by a connecting portion to form a gap  
20 therebetween, the optical fiber being mounted in the fiber holding portion so  
that the beveled end extends into the gap and the optical detector being  
mounted in the detector holding portion so that the detector surface is  
adjacent and tilted and rotated with respect to the beveled end.

4. The fiber pigtailed assembly as recited in claim 3 further comprising means for adjusting a tilt angle of the detector surface with respect to the beveled end.

5 5. The fiber pigtailed assembly as recited in claim 4 wherein the adjusting means comprises:

the connection portion being flexible; and

means coupled to the housing for angularly varying the gap to adjust the tilt angle by rotating about a point in the connection portion.

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6. The fiber pigtailed assembly as recited in claim 5 wherein the angularly varying means comprises a screw threaded through one of the fiber and detector holding portions to contact an opposing surface of the gap such that adjustment of the screw causes the gap to angularly widen.

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7. The fiber pigtailed assembly as recited in any of claims 1-6 further comprising means for coupling an opposing end of the optical fiber to an external optical fiber with low back reflection and minimum polarization-dependent responsivity.

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8. The fiber pigtailed assembly as recited in claim 7 wherein the coupling means comprises:

an input ferrule containing an end of the external optical fiber, the end being beveled;

an intermediate ferrule containing an intermediate optical fiber and having beveled ends arranged approximately orthogonal to each other;

an output ferrule containing the opposing end of the optical fiber, the opposing end being beveled; and

5 means for holding the input, intermediate and output ferrules in position relative to each other so that the respective beveled ends are parallel to each other.

9. The fiber pigtailed assembly as recited in claim 8 wherein the holding  
10 means further comprises a gap between the input ferrule and the intermediate ferrule when the diameter of the external optical fiber is less than the diameter of the intermediate optical fiber.

10. A coupler for coupling a fiber pigtailed assembly to an external optical  
15 fiber with low back reflectance and minimum polarization-dependent responsivity comprising:

an input ferrule containing an end of the external optical fiber, the end being beveled;

an intermediate ferrule containing an intermediate optical fiber, the  
20 intermediate optical fiber having opposing ends that are beveled in approximately orthogonal planes;

an output ferrule containing a coupling end of an optical fiber of the fiber pigtailed assembly, the coupling end being beveled; and

means for holding the input, intermediate and output ferrules in position relative to each other such that the respective beveled ends are parallel to each other.

5        11. The coupler as recited in claim 10 wherein the holding means further comprises a gap between the input ferrule and the intermediate ferrule when the diameter of the external optical fiber is less than the diameter of the intermediate optical fiber.

10       12. A method of adjusting a fiber pigtailed assembly for coupling light from an optical fiber to an optical detector with low back reflectance and minimum polarization-dependent responsivity comprising the steps of:

         providing a source of light having a plurality of polarization states to the optical fiber;

15       adjusting a rotation angle between a beveled end of the optical fiber and a detector surface of the optical detector adjacent the beveled end, the detector surface being tilted with respect to the beveled end, while observing an electrical output from the optical detector for a minimum peak-to-peak value.

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13. The method as recited in claim 12 further comprising the steps of:

         adjusting a tilt angle between the detector surface and the beveled end while observing the electrical output from the optical detector for the minimum peak-to-peak value; and

iterating the rotation and tilt angle adjusting steps as necessary to obtain the lowest minimum peak-to-peak value for the electrical output.